

the cell and at the lower end as far as the submedian nervure, where it is narrower than at the top and slightly curves outwardly; a curved row of five subapical white spots.

Underside. Both wings dusky brown, paler towards the apex and outer margin of anterior wings and crossed by an irregular black line, which, on anterior wings, is narrowly margined externally from the costa to the upper median nervule by bluish white, thence internally to the middle of posterior wings by dusky white; outside the black line on both wings is a rather broad, ill-defined, darker brown band; on anterior wings three irregular bright brown lines cross the cell beyond the middle, the line nearest the base bordered externally and irregularly with bluish white; the five white subapical spots as above, beneath which are three nearly obsolete ocelli. Posterior wings beyond the middle with two conspicuous and several other nearly obsolete ocelli; a bluish-white spot in the cell on the median nervure edged externally with black.

Expanse of wings $2\frac{3}{4}$ inches.

Nearest to *D. dascon* and *dasyclus*, Godman and Salvin.

XXV.—*Synoptical Revision of the Family Halacaridæ.*

By Dr. E. L. TROUESSART*.

THE memoir in course of preparation, with the assistance of M. G. Neumann, upon the "Marine Acarina of the shores of France" being unavoidably retarded by the execution of the plates, we think it as well to give at present a synopsis of the actually known species of the family Halacaridæ. We hope in this way to induce the sending of new materials which will enable us to complete the investigation of this marine fauna which is still so little known.

The number of memoirs relating to the marine Acarina is still but small. We shall content ourselves with giving the following list † of the more important of them, referring

* Translated from the Bulletin Scientifique de la France et de la Belgique, tome xx. 1889, pp. 224-251.

† *Bibliography.*

1. GOSSE, P. H. "On new and little-known Marine Animals" (Ann. Mag. Nat. Hist. ser. 2, vol. xvi. (1855) pp. 27 & 305, pls. 3 & 8).
2. HODGE, G. "Contributions to the Zoology of Seaham Harbour. I. On a new Marine Mite. II. On some undescribed Marine Acari" (Trans. Tyneside Nat. Field Club, 1860, vols. iv. & v.).

for a more complete bibliography to Dr. Lohmann's monograph indicated below.

In the following pages each bibliographic reference will be indicated by its number placed in parentheses, after the name of the author of the memoir cited.

Besides the species already known, we shall give the diagnoses of several new genera and species, derived not only from the French coasts, but also from other regions of the globe (Tierra del Fuego, New Zealand).

Family Halacaridæ, Murray, 1877.

Char. Exclusively marine Acarina, destitute of tracheæ, with a distinct rostrum; maxillary palpi free, fusiform, of 4 (rarely 3) joints, the first and third short, the second elongated, the fourth, or terminal, pointed and styliform. Mandibles terminated by a straight or recurved claw, which represents the immobile finger of the chelicera, the movable one being atrophied. Hypostome formed by a more or less elongate bivalve furrow, of which the two symmetrical parts are soldered together at the base or throughout their length. Three eyes, of which two are situated at the normal place upon the cephalothorax, and the third, unpaired one, in front upon the epistome. Integuments strengthened by more or less extensive dorsal and ventral dermal plates, with the surface smooth, grained, punctured, or sculptured. Legs lateral, well developed, terminated by a double claw, which is generally pectinate.

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3. BRADY, G. S. "A review of the British Marine Mites, with descriptions of some new species" (Proc. Zool. Soc. 1875, p. 301, pl. 42).
 4. ——. "Notes on British Freshwater Mites" (*ibid.* 1877, p. 24, pl. 4).
 5. MURRAY, A. "Economic Entomology: Aptera, 1877," pp. 205 *et seqq.* (a summary of the preceding papers, with figures).
 6. CHILTON, C. "On two Marine Mites (Halacaridæ)" (Trans. New Zeal. Inst. vol. xv. 1883, with fig.).
 7. TROUËSSART, E. "Note sur les Acariens marins recueillis par M. Giard au Laboratoire maritime de Wimereux" (Comptes Rendus, 5 Nov. 1888, p. 753; reproduced with some modifications in the Bull. Bibl. Scient. de l'Ouest, Niort, 1888, no. 8).
 8. LOHMANN, H. "Die Unterfamilie der Halacaridæ (Murray) und die Meeremilben der Ostsee" (Zool. Jahrb. iv. 1889, p. 269, with 3 plates; issued as a separate paper in December 1888).
 9. TROUËSSART, E. "Sur les Acariens marins des côtes de France, 2^e Note" (Comptes Rendus, 3 June, 1889, p. 1178).
 10. ——. "Diagnoses d'espèces et genres nouveaux d'Acariens marins des côtes de France" (Le Naturaliste, 11^e année, 1889, pp. 162 & 181).

The absence of tracheæ and the form and arrangement of the palpi, the last joint of which is pointed and styliiform (and not palpiform), suffice to distinguish this family from that of the Trombididæ, with which it has been proposed to unite the Halacaridæ. From its characters the latter family may be placed between the Gamasidæ and the Sarcoptidæ. At present we know about 7 genera and 35 species.

The Halacaridæ live in the sea and in the brackish water of estuaries and salt-marshes. They walk and climb, rather than swim, upon the bottom, the rocks, Algæ, and fixed or slow-moving animals of which they are *commensals*. Their food seems to be varied; it consists in great part of Diatomeæ and of organic matters in course of decomposition derived from the fragments rejected by the animals of larger size upon which we find them, and which belong to all classes—Crustacea, Mollusca (oysters, mussels, &c.), Echinoderms, Acalephæ, Hydroids, Corals, Bryozoans, Sponges, &c. The young of many species may be regarded as *parasites*, feeding almost exclusively upon organic matters, especially the ova of Copepoda, and attaching themselves to other animals to profit by what falls from their table. The adults on the contrary lead a vagabond life, and seek in preference the Diatoms which they find in abundance attached to the fronds of Algæ.

We find the Halacaridæ from the zone of stranded Algæ to a depth of 30–50 fathoms; but it is in the *Laminarian zone*, or more exactly in the *zone of the Corallines and Red Algæ*, that they are most abundant, at depths of 5–10 fathoms. Very few are found upon the brown Algæ (Fucaceæ); on the other hand they are numerous and varied specifically upon the red and calcareous Algæ (Floridæ and Corallinæ). Upon the great rocky bottoms destitute of vegetation we meet with types (*Scaptognathus*, *Coloboceras*) which are wanting everywhere else. Their geographical distribution, although in general pretty extensive, presents some remarkable peculiarities; thus, the genus *Agave*, an essentially southern type, widely diffused in the Mediterranean and extending to the southern hemisphere (Tierra del Fuego), does not appear to advance in the ocean to the north of the mouth of the Loire, and is wanting in the North Sea and the Baltic.

The distinction of the species in this group presents great difficulties in consequence of the great uniformity of the type, of variations of colour due to the kind of food, and of this peculiar fact, which it is important to mention, that the *nymphs*, before their last moult, *already present a rudiment of*

the genital organ (H. Lohmann). The legs are generally shorter in the nymphs, which have in each limb *one joint less** than the adults. Otherwise the construction of the rostrum, tarsi, and dermal plates is very nearly the same as in the adult.

Many individuals at the moment of their capture have the body and limbs incrustated with a sort of mud, in the midst of which Acinetæ are sometimes fixed in considerable numbers.

*Synopsis of the Genera and Species of the
Family Halacaridæ.*

Genus RHOMBOGNATHUS, Trt. 1888.

Trouessart (7), November 1888, p. 754.

Aletes, Lohmann (8), December 1888, p. 51.

Pachygnathus, pt., Gosse (1), 1855.

Char. Rostrum short, conical, with the maxillary palpi lateral, applied closely along the mandibles, which are terminated by a hooked claw. Tarsus separated from the double terminal claw by an additional cylindrical, slender, and more or less elongated joint.

Seven species, of which four occur on the French coasts. Most of them are of a greenish-black colour, of small size, and of a short, thickset form.

1. *Rhombognathus pascens*.

Aletes pascens, Lohm. (8), p. 64, figs. 64, 70.

Char. Claws angularly recurved; additional piece of the tarsus produced in the form of a hook *only in the anterior feet*. Coxæ of the first pair of legs united into a single ventral plate. Ocular plates with only a single cornea. Total length 0.35 millim.

Hab. Atlantic coasts, France: Baie de Port-lin, near Le Croisic, upon stranded red Algæ (*E. Chevreux*), rather rare. Shore of the Channel, Etretat (*Mlle. C. Trouessart*). Baltic, Kiel (*Lohmann*), upon sandy shores, living and stranded red Algæ.

2. *Rhombognathus Seahami*.

Pachygnathus Seahami, Hodge (2), 1860.

Aletes Seahami, Lohm. (8) p. 57, figs. 88, 94.

Char. Claws angularly recurved; additional piece of the

* *Four*, instead of *five* as in the adult.

tarsus *hooked in all the feet*. Coxæ of the first pair united into a single ventral plate. *Claws with a simple comb*. Ocular plates having only a single cornea. Total length 0·37 millim.

Hab. Atlantic coasts: France, Le Croisic, Pen-bronn and Port-lin (*Chevreux*), upon Corallines, brown Algæ, and stranded Algæ. Very common everywhere; the most widely distributed species of the coast of Le Croisic. Shores of the North Sea; England, Seaham Harbour, littoral zone. Shores of the Baltic, Kiel (*Lohmann*), region of Red Seaweeds.

3. *Rhombognathus setosus*.

Aletes setosus, Lohm. (8), p. 58, figs. 79, 80.

Char. Claws recurved *like sickles*; additional joint of the tarsi *with no hook*; anterior margin of the epistomial plate in the form of a *hood entirely concealing the rostrum*. Coxæ of first pair well separated, forming a narrow chitinous band on each side. Ocular plates with the cornea simple. Total length 0·32 millim.

Hab. Shores of the Baltic, Kiel (*Lohmann*); sandy shores.

4. *Rhombognathus nigrescens*.

Pachygnathus nigrescens, Brady (4), p. 26, pl. iv. figs. 4, 5.

Aletes nigrescens, Lohm. (8), p. 60.

Char. Claws angularly recurved and furnished *with a double comb*, without lateral teeth; additional joint of tarsi furnished with a hook on all (?) the feet. Ocular plate with the cornea simple. Size very large, double that of the other species. Total length 0·72 millim.

Hab. A single specimen found in England by Brady in a pool of fresh water on the rocks (Northumberland).

5. *Rhombognathus notops*.

Pachygnathus notops, Gosse (1), p. 305, pl. viii. figs. 1-4.

Aletes notops, Lohm. (8), p. 62, figs. 89, 94.

Char. Claws recurved *like sickles*, with a lateral tooth, but without a comb; additional joint of tarsi without a hook; *epistomial plate leaving the rostrum exposed*; ocular plates furnished *with a double cornea*. A plumose hair on the tarsi of the first pair of feet. Total length 0·35 millim.

Hab. Shores of the Ocean. France: Le Croisic, Pen-bronn (*Chevreux*), on Corallines (*Corallina officinalis*) and green Algæ, pretty common. British coasts: Shetland

Islands, Ilfracombe (*Gosse*), littoral zone. Baltic, Kiel (*Lohmann*), region of Red Seaweeds.

6. *Rhombognathus magnirostris*.

Trouessart (10), *Le Naturaliste*, August 1889, p. 181.

Char. Like *R. notops*, but larger and stouter; additional joint of the feet much elongated, not hooked. Rostrum large and broad. Epistome cut off squarely at the level of the base of the palpi. Legs with long and slender setæ. Two plumose hairs well developed on the third joint of the *four pairs of feet*. Comb of the accessory tooth of the claws broad and strong. Total length 0.45 millim.

Hab. Shores of the Mediterranean, upon the Corsican Moss (*Gigartina helminthocorton*) and the Corallines and Red Seaweeds collected in the same localities and confounded under that name.

R. magnirostris, var. *plumifer*, var. nov.

Differs from the type by the presence of a *third feebly plumose hair* on the third joint of all the legs. The *other two strongly plumose*. Total length 0.38 millim.

Hab. Shores of Tierra del Fuego: Saddle Island (Cape Horn), upon Seaweeds (*Codium fragile*, *Ceramium Dozii*), collected by M. Hariot (Mission du Cap Horn).

7. *Rhombognathus minutus*.

Pachygnathus minutus, Hodge (2), 1860.

Aletes minutus, Lohm. (8), p. 65.

Char. Claws falciform, pectinated, with a lateral tooth; additional joint of tarsus hooked. Ocular plates with a double cornea. Size small? (species imperfectly known). Total length 0.28 millim.

Hab. English coast: Seaham, Northumberland (*Hodge*); littoral zone.

Genus SIMOGNATHUS, Trt., 1889.

Trouessart (9), p. 1179, & (10), p. 162.

Pachygnathus, pt., Brady (3), p. 306.

Char. Rostrum short and broad, with *maxillary palpi touching each other above, applied to one another in the median*

line, passing beyond the mandibles and the hypostome, their extremities being directed downwards (and not inwards, as in *Rhombognathus*). No additional joint in the tarsus; legs of six joints.

By the arrangement of the parts of the mouth, this genus approaches *Leptognathus* rather than *Rhombognathus*. It may be regarded as a *Leptognathus* with a much shortened rostrum. A single known species.

1. *Simognathus sculptus*.

Pachygnathus sculptus, Brady (3), p. 306, pl. 42. figs. 1-6.

Simognathus sculptus, Trouessart (9), p. 1179, & (10), p. 162.

Char. Legs nodose, with angular joints, especially the penultimate joint of the anterior pair, which is armed with a strong spine at its posterior and inferior angles. Claws not pectinated; those of the anterior feet stronger and less recurved than those of the other feet. All the plates of the cuirass (except the sternal and ventral plates) strongly pitted, as also the hypostome and the first three joints of the legs. Total length 0.42 millim.

Hab. This fine species appears to occur only upon rocky bottoms, at depths varying from 10 to 50 metres. Shores of France: Rochers de Basse Kikerie (near Le Croisic), dredging by means of swabs (*Chevreaux*), a single individual. English coast: Durham and N. Yorkshire, Robin Hood's Bay (*Brady*), at 35 fathoms.

Genus COLOBOCERAS, gen. nov.

Char. Rostrum cylindro-conical, with lateral palpi parallel to the sides of the rostrum, formed of three joints—the first short, the second three times as long; the third rather short, conical, terminated by a small point. Mandibles styliform, terminating in two long setæ. Legs of five joints.

This new genus approaches *Halacarus* more than any other genus, and may be regarded as forming the passage between *Rhombognathus* and *Halacarus*. It differs essentially from the latter by its palpi, which have only three joints, the third and fourth appearing to be soldered into one. Only one species known.

1. *Coloboceras longiusculus*, sp. n.

Char. Body elongate, of a garnet-red colour, nearly black; the legs of a lighter red, much shorter than the body, slightly

nodose, with the claws terminated by two teeth, the larger of which is inserted nearly at a right angle; destitute of a ciliated comb. Rostrum small, with the epistome cut squarely at the base of the palpi, the hypostome prolonged into a bivalve spatuliform furrow, within which the mandibles slide, each terminating in a long seta, which passes beyond the rostrum. Anus terminal. Total length 0.50 millim.

Hab. Shores of France: Roches de Castouillet (near Le Croisic), by dredging with the aid of swabs (*Chevreux*); two individuals.

Genus HALACARUS, Gosse, 1855.

Halacarus, Gosse (1), p. 27.

Halacarus, *Copidognathus*, and *Leptopsalis*, Trouessart (7), p. 753.

Char. Rostrum elongated, cylindro-conical; palpi free, parallel, articulated upon the sides of the rostrum, composed of four joints, of which the third is much shorter than the terminal joint, which is strongly conical, elongated, often styli-form, and furnished with three divergent setæ upon its inner margin; second joint the longest of all. Hypostome in the form of a more or less elongated bivalve furrow, triangular or truncated in front. Mandibles (chelicerae) terminated by a single finger, generally hooked. Claws of the feet inserted directly upon the tarsus without any additional joint.

The number of species of this genus is already considerable, at least seventeen, eleven of which occur upon the French coasts. This is the reason that we attempted to subdivide it by forming the genera *Copidognathus* and *Leptopsalis*, the former founded upon a species (*C. glyptoderma*) in which the mandibles are very strong, and terminate in a straight, knife-shaped finger with a serrated blade. But a thorough examination of several allied species having shown this character to be rather variable, we have preferred to reunite this species with the genus *Halacarus* proper. The genus *Leptopsalis* includes two species in which the last joint of the palpi is bifid, simulating a little forceps; this character seems to be of sufficient importance for us to retain this group as a subgenus.

Subgenus HALACARUS, proper.

Char. Last joint of the palpi terminating in a single point.

In the enumeration of the species we shall follow the order and arrangement adopted by M. Lohmann in his Monograph (8).

GROUP A *a*.—Rostrum small, triangular, conical, with rather short palpi, *the last joint conical at its point only, and very little longer than the penultimate*. A single exotic species, which, by the shortness of its palpi, approaches the genus *Coloboceras*.

1. *Halacarus parvirostris*, sp. n.

Char. Rostrum presenting the characters of the group; palpi with the last joint cylindrical for four fifths of its length, and terminating suddenly in a very small point. Hypostome groove-like, constricted in front, truncated at the level of the base of the last joint of the palpi. Epistome presenting an obtuse, rounded projection at the level of the base of the rostrum. Anterior legs shorter and more robust than the posterior, with the second joint inflated, and the fourth nearly triangular, furnished with a spine beneath; claws with no ciliated comb; no unguual groove on the tarsus. Dermal plates finely punctured in indistinct rosettes. Total length 0.40 millim.

Hab. On seaweeds from New Zealand sent to the Museum at Paris (*M. Hariot*). This species is, in all respects, very distinct from the two species described by Chilton, which will be mentioned further on.

GROUP A.—Rostrum narrow, with the lateral margins parallel as far as the basal region; hypostome compressed, longer than the basal part of the rostrum; third joint of the palpi bearing at its antero-internal angle a very fine spine directed obliquely forward; fourth joint sabre-shaped. Sexual aperture projecting in the form of a bivalved bulb. Two species.

2. *Halacarus Murrayi*.

Lohmann (8), p. 70, figs. 83, 86.

Char. Those of the group; anus terminal. Legs slender, the posterior very long; claws much elongated, pectinate; no unguual groove on the tarsi. Dermal plates feebly developed. Ocular plates with a single cornea, and in the inner angle a large pore* with a small chitinous plate behind it. *All the hairs of the legs very long and very slender, not spinous*. Total length 0.52–0.57 millim.

Hab. Baltic, Kiel (*Lohmann*), in the region of Red Sea-

* To see these details of the chitinous cuirass of the Halacaridæ it is indispensable to treat them with a more or less concentrated solution of potash, which renders them colourless and transparent.

weeds on the Florideæ, sponges, and *Flustræ*, at a depth of about 12 fathoms.

3. *Halacarus levipes*.

Trouessart (10), *Le Naturaliste*, p. 162.

Char. Very similar to the preceding species, but differing from it in the presence of *spinous hairs*, mixed with the long slender hairs, upon the anterior legs. Hypostome less compressed, elongate triangular. It is perhaps only a southern variety of *H. Murrayi*. Total length 0·50 millim.

Hab. Shores of the Mediterranean. A single individual found upon Corsican moss (*Gigartina helminthocorton*).

GROUP B.—Rostrum triangularly conical, with the apex directed forward; hypostome shorter than the basal part of the rostrum, with no constriction at its base. Last joint of palpi conical, more or less pointed, but not styliform. Genital aperture in the form of an oval frame, differing but little in the two sexes.

Subgroup 1.—Body compressed, abdomen elongated as in the preceding group, flanks parallel to the level of the insertion of the legs.

4. *Halacarus floridearum*.

Lohmann (8), p. 72, figs. 111, 115.

Char. Anus terminal; third joint of palpi furnished on its inner margin with a thick, non-setiform spine. *Ocular plates with no cornea*; third joint of first pair of legs bearing only three hairs planted in a triangle upon the most inflated part. *Claws ciliated. Dermal plates pitted except the sternal plates.* Total length 0·45–0·50 millim.

Hab. Baltic, Kiel (*Lohmann*), region of Red Seaweeds, on Florideæ, at depths of 3–12 fathoms.

5. *Halacarus balticus*.

Lohmann (8), p. 73, figs. 103, 120.

Char. Anus terminal; third joint of palpi furnished with a strong spine upon its inner margin; third joint of first pair of legs having *two dorsal setæ* behind the triangle formed by the three hairs inserted about the middle. *Ocular plates with a large cornea.* Epistomial plate with a nearly straight anterior margin. *Claws not ciliated.* Tarsi with a slightly deve-

loped ungueal groove. *Dermal plates pitted only on the back.* Total length 0·60–0·65 millim.

Hab. French coast: Pas de Calais, at Wimereux (*Giard*), upon *Eudendrium capillare*; Le Croisic (*Chevreur*), upon Bryozoa (*Alcyonidium hirsutum*), and Baie de Port-lin upon *Facus serratus*. Baltic: Kiel (*Lohmann*), region of Red Algæ, at 12 fathoms.

6. *Halacarus striatus*.

Lohmann (*S.*) p. 74, fig. 117.

H. inermis, Trouessart (*ī*), p. 754.

Char. Anus terminal. *No spine on the third joint of the palpi.* Ocular plates narrow, without cornea. Dermal plates pitted only on the back. Claws pectinate. No ungueal groove on the tarsi. Total length 0·62–0·70 millim.

Hab. French coasts: Le Croisic (*Chevreur*), Laminarian zone, upon Corallines; Baie de Port-lin and open coast upon *Corallina officinalis*. North Sea, upon *Thuiaria Thuia*, off Newcastle-on-Tyne (*Giard*). Baltic: Kiel (*Lohmann*), region of Red Algæ, at 3–5 fathoms.

Subgroup 2.—Abdomen short, with a semicircular outline posteriorly; flanks swelled, convex, and not parallel.

7. *Halacarus spinifer*.

H. ctenopus, pt., Trouessart (*ī*), p. 754.

H. globosus, Trouessart. MS., *loc. cit.*

H. spinifer, Lohmann (*S.*), p. 75, figs. 101, 102.

Char. Palpi with the third joint furnished with a strong spine on its inner margin; third joint of first pair of legs armed with two spines behind the triangle formed by the dorsal setæ. Claws of the first pair very short and very stout; *all the claws pectinate.* Ocular plates with corneæ. Epistomial plate produced into a point above the rostrum. Anus terminal.

The adults are generally of a dark colour (brown, more or less blackish); the young and the nymphs are light-coloured, yellowish, or of a more or less lively coral-red. It is the largest species known in the family, and one of the commonest on our shores. Total length 1·00–1·10 millim.

Hab. French coasts: Pas de Calais, Wimereux (*Giard*), upon the byssus of mussels, on *Lasæa rubra* and *Eudendrium capillare*; canal from Caen to the sea (*Le Sènèchal*) in brackish water, on Hydroids; Atlantic coast; Le Croisic (*Chev-*

reux) upon Algæ (Corallines &c.), very common. Baltic : Kiel and Gotland (*Lohmann*) upon Red Seaweeds (at 12 fathoms) and on Green Seaweeds.

8. *Halacarus ctenopus*.

H. ctenopus, Gosse (1), p. 28, pl. iii. figs. 6-10; Brady (3), p. 310; Lohmann (8), p. 77.

Char. Like the preceding species, but smaller and more elongated, and never presenting the dark colour of the adult *H. spinifer*. Epistome with an acute anterior point. Claws of the first pair very similar to those of the others. *Claws of the third and fourth pairs destitute of ciliated combs*, while those of the other two pairs (2 and 3) are provided with them. Anus terminal. *A notogastric plate*. Ungueal groove but slightly developed, as in the preceding species. Total length 0.80 millim.

Hab. French coasts (rare): Le Croisic (*Chevreux*), on floating seaweeds. Coasts of England and Ireland, the Shetland islands, Scilly, &c. (*Gosse, Brady*), at depths varying, according to the localities, from 7 to 35 fathoms (littoral, Laminarian and Coralline zones).

9. *Halacarus actenos*, sp. n.*

Char. Very like the preceding species, *but all the claws destitute of ciliated combs*. *No notogastric plate*. Epistomial plate terminating behind in a triangle. *No ungueal groove on the tarsi*. Total length from 0.65 millim. (male) to 0.75 millim. (female).

Hab. French coasts (Atlantic), scarcer than *H. spiniger*, but more generally distributed than *H. ctenopus*: Le Croisic (*Chevreux*), Baie de Port-lin, on *Fucus serratus*; Arcachon, on oysters (*Trouessart*); Saint Jean-de-Luz (*Neumann*), on Algæ (a male individual more brightly coloured (orange-red) and with shorter limbs than the males from Le Croisic).

10. *Halacarus Harioti*, sp. n.

Char. Epistomial plate forming a very obtuse angle in

* This species may perhaps be the *Halacarus ctenopus*? of Grube (*H. frontispinis* in the text), found by that naturalist at Roscoff (Abhandl. schles. Ges. Naturw. 1868, pp. 123, 124) and described as resembling *H. ctenopus*, but with non-pectinate claws. However, Grube says formally that he did not see, on the penultimate joint of the palpi, the short and strong spine which characterizes *H. actenos* as well as *H. ctenopus*.

front. All the claws pectinate, those of first pair like the others; a well-developed *ungueal groove* on the tarsi. Mandibles slender, with a feeble claw. A well-developed notogastric plate. In other respects like the preceding species. Total length 0·70 millim.

This species is dedicated to M. Hariot, the botanist attached to the "Mission du Cap Horn," who collected it at the same time as the Algæ of that region.

Hab. Shores of Saddle Island, Cape Horn (*Hariot*), upon Algæ (*Codium fragile*).

Subgroup 3.—Form of the rostrum and palpi as in the preceding subgroup, but the third joint of the palpi without the internal spine. Plates of the cuirass greatly developed and strongly sculptured as in the following subgroup. Sculpture of the notogastric plate forming longitudinal lines. Epistomial plate cut square in front, leaving the rostrum exposed.

11. *Halacarus Fabricii*.

Lohmann (8), p. 79, figs. 81, 82.

Char. Ocular plates wide, furnished with a very visible cornea. Median spine of the penultimate joint of the first and second pairs of legs finely pennate and furnished with a tubercle at the base. Epistomial plate rounded in front. All the claws pectinate; tarsus with a slightly developed ungueal groove. Anus terminal. Total length 0·52 millim.

Hab. French coast: Arcachon (*Trouessart*), on oysters; shores of the Mediterranean (*Trouessart*), on Corsican moss. Baltic: Kiel (*Lohmann*), on fixed and floating Green Algæ and on Red Algæ (at 12 fathoms).

12. *Halacarus loricatus*.

Lohmann (8), p. 81.

Char. Ocular plates wide, with the cornea apparent. *Spine of the penultimate joint not pennate* and without a tubercle at the base. Otherwise like the preceding species. Total length 0·40 millim.

Hab. Baltic: Kiel (*Lohmann*), upon Red Algæ at 12 fathoms.

13. *Halacarus glyptoderma*.

Copidognathus glyptoderma, Trouessart (7), p. 754.

Char. Like the preceding species, *but the hypostome square, truncated, wider and shorter than that of H. loricatus*. Man-

dibles stout, terminated by a straight nail in the form of a serrated knife-blade. Spine of anterior feet not pennate. Epistomial plate much developed, with three impressions sculptured in relief, one on each side and one in front. Total length 0·50 millim.

Hab. Atlantic coast of France: Marennes (Charente-Inférieure), upon oysters (*Trouessart*).

14. *Halacarus Lohmanni*, sp. n.

Char. Like the preceding, especially *H. Fabricii*. Anterior legs stouter and shorter than the posterior, with the margins of the joints angular beneath; tarsus with a well-developed ungueal groove. Total length 0·40 millim.

This species is dedicated to Dr. H. Lohmann, author of the monograph of the Halacaridæ of the Baltic.

Hab. Shores of New Zealand; upon Algæ sent to the Paris Museum (*Hariot*).

GROUP C.—Rostrum with the base wide and constricted; the hypostome short, forming with the rostrum a reversed heart; cuirass complete, the strongly sculptured plates only leaving between them a linear space. Last joint of the palpi slender, elongate, styliform.

15. *Halacarus rhodostigma*.

Gosse (1), p. 27, pl. iii. figs. 1-5; Lohmann (8), p. 83.

Char. Claws of the feet destitute of lateral teeth and ciliated combs. Tarsi with no ungueal groove. Cuirass complete, covered with points in rosette not forming more salient patterns or longitudinal streaks. Second joint of the anterior legs inflated. Total length 0·35-0·40 millim.

Hab. French coast: Arcachon, Marennes (*Trouessart*), upon oysters (common). English coasts: North Sea (Northumberland), Channel (Weymouth, *Gosse*); littoral zone of Laminariæ and Corallines.

16. *Halacarus gracilipes*, sp. n.

Char. Claws destitute of lateral teeth and of combs as in the preceding species. No ungueal groove on the tarsus. Cuirass complete, with a sculpture forming projections and longitudinal lines, finer upon the epistomial and notogastric plates. Second joint of the anterior limbs not more inflated than that

of the other legs, which are all slender with cylindrical joints. Total length 0·40–0·45 millim.

Hab. French coasts: Le Croisic (*Chevreux*), upon *Lascea rubra*; Roches de Castouillet, by dredging with swabs; Mediterranean (*Trouessart*), upon Corsican moss (*Gigartina helminthocorton*). English coast: Scilly Islands (in a preparation communicated by Mr. Brady, mixed up with *Halacarus ctenopus*).

17. *Halacarus oculatus*.

Hodge (2); Lohmann (8), p. 82, figs. 67, 68.

Char. Like the two preceding, but rather more elongated; second joint of anterior limbs inflated. Claws furnished with a lateral tooth and a ciliated comb. Cuirass with a sculpture forming projections and lines as in the preceding species. Total length 0·38–0·42 millim.

Hab. French coast: Arcachon (*Trouessart*), upon oysters. English coast: North Sea, Seaham (*Hodge*). Baltic, Kiel (*Lohmann*); region of Red Algæ and of floating seaweeds.

18. *Halacarus gibbus*, sp. n.

Char. Legs very nodose, having the second and fourth joints inflated on the four pairs, but especially on the anterior pairs; claws not pectinate, but furnished with a small slender tooth. Epistomial plate presenting in the middle a strong oblique pyramidal crest, the point of which is confounded with the anterior point of the plate, thus forming a sort of boss or hood which projects in an acute angle above the rostrum. Cuirass presenting projections and lines with distinct punctation, as in the preceding species. Total length 0·40–0·45 millim.

Hab. French coast: Le Croisic (*Chevreux*), Roches de Castouillet, by dredging with swabs.

Subgenus LEPTOPSALIS, Trt., 1888.

Genus *Leptopsalis*, Trouessart (7), p. 754.

Char. Rostrum elongated, with the palpi slender, parallel, the last joint terminated by a double point; hypostome forming a narrow spatuliform groove, attaining the base of the last joint of the palpi. Otherwise the characters of the genus *Halacarus* proper.

Two or three species. The type is *Leptopsalis Chevreuxi*, Trt.

19. *Halacarus (Leptopsalis) longipes*.

Trouessart (7), p. 754.

Char. Facies of the nymphs of *Hal. spinifer*, but presenting the characters of the subgenus. A small spine directed obliquely forward upon the inner margin of the penultimate joint of the palpi. Epistome cut squarely in front. Legs long, cylindrical; claws pectinate, with a very feeble lateral tooth; no ungueal groove. Anterior legs with slender setæ, sparingly spinous. Anus terminal. Total length 0.60 millim.

Hab. French coast: Pas-de-Calais, Wimereux (*Giard*), on the byssus of mussels. A single individual, 2nd nymph *.

20. *Halacarus (Leptopsalis) Chevreuxi*.

Trouessart (10), p. 162.

Char. Body ovoid-conical, with the anus terminal. *Legs very nodose, with the penultimate joint pyriform.* Epistome short, *bilobate*, with a median emargination. Rostrum much elongated, slender, and compressed; *hypostome very long, thin, and spatuliform*; mandibles very slender, nearly styli-form. Claws pectinate, with a small median piece. Tarsus with an ungueal groove. The variety from the Mediterranean has the penultimate joint of the legs rather angular than pyriform. The cuirass is nearly smooth. Total length 0.80–0.90 millim.

Hab. French coast: Le Croisic (collected in numbers by M. Chevreux, to whom the species is dedicated), Baie de Port-lin on Red Seaweeds (*Florideæ*), on *Polysiphonia* and on *Alcyonidium hirsutum*; Baie de Croisic on *Corallina officinalis*, Laminarian zone; Banc de Basse-Hergo on brown Alga, &c.; Saint-Jean-de-Luz (*Neumann*) on Algæ. Shores of the Mediterranean (*Trouessart*) on the Corsican moss (*Gigartina helminthocorton*) †.

* Another Halacarid, taken by M. Chevreux at Le Croisic upon Sponges (*Halichondria panicea*), greatly resembles this species and has the extremity of the palpi bifid; but the hypostome is less spatuliform, the hairs of the anterior legs are spinous, as in *H. spinifer*, and there is an ungueal groove.

† A third species would appear to take its place in this subgenus, viz.:—*Halacarus olivaceus*, Grube, Abhandl. schil. Ges. Naturw. 1868, p. 121, pl. ii. fig. 3. This species, which we know only from Grube's figure and description, approaches *Leptopsalis Chevreuxi* in the form of its rostrum and legs. Obtained by Grube at the island of Batz, near Roscoff.

Genus AGAUE, Lohmann, 1889.

Lohmann (8), p. 85.

Char. Palpi articulated laterally to the rostrum, elongated, mobile, *third joint scarcely shorter than the last one*, which is conical and bears some short setæ. Otherwise the characters are those of *Halacarus* proper.

M. Lohmann (*l. c.*) has taken as the type of this genus the *Halacarus parvus* of Chilton*, a species from New Zealand which is known to us only from the description and figure given by the last-named author.

But this description and figure leave some doubts as to the true affinities of this species, which might well be a *Leptopsalis*. In consequence of this M. Lohmann (*in litteris*) has kindly agreed with us to take as the type of the genus *Agauë brevipalpus*, Trt., a species from the Atlantic and Mediterranean, which distinctly presents the characters of the genus as indicated by M. Lohmann himself.

This genus, which is essentially southern (as it does not advance towards the north beyond the mouth of the Loire), includes, besides *H. parvus*, four species, of which three are European.

1. *Agauë brevipalpus*.

Trouessart (10), p. 181.

Char. Rostrum elongated, with a broad conical base, and with the anterior region (starting from the base of the palpi) narrow and compressed; *hypostome passing beyond the point of the palpi*; third joint of the palpi bearing a short and slender spine directed forward. Epistome terminated in front by a *very obtuse point*. Anterior legs more robust than the

* Chilton, *l. c.* (6), describes two species of Halacaridæ from the shores of New Zealand, viz. :—

1. *Halacarus parvus*, Chilton.

Agauë parva, Lohmann, *l. c.* p. 86.

Char. Epistomial plate cut squarely, slightly rounded in front. Claws pectinate, furnished with a large lateral tooth; an ungueal groove. First pair of legs with close-set tactile hairs. Total length 0·70 millim.

Hab. New Zealand, Littleton Harbour, littoral zone.

2. *Halacarus truncipes*, Chilton.

Char. This species is remarkable for the great development of the ungueal groove of the tarsus, within which the claws can be withdrawn and completely concealed, in such a way that Chilton supposes that they do not exist and are replaced by simple hairs.

Same habitat.

others, bearing large prickles with blunt or turned points. *Claws not pectinate, with no median piece.* Tarsi with no ungueal groove. Anus terminal. Dorsal plates not well-developed, separated by a *wide space of striated and shagreened skin.* Total length 0·53 millim.

Hab. French coast: Arcachon (*Trouessart*) on oysters, Le Croisic (*Chevreaux*) on Red Seaweeds (*Floridææ*), Baie de Port-lin. Mediterranean (*Trouessart*) on the Corsican moss (*Gigartina helminthocorton*).

2. *Agauë hirsuta.*

Trouessart (10), p. 181.

Char. Like the preceding species, but larger and more robust. *Legs of the first pair very long and very stout, twice as thick as the others,* with very stout blunted prickles. *Epistome acutely pointed.* Rostrum short and stout, *with the hypostome shorter than the palpi,* deeply bilobed. Claws of the mandibles recurved and very stout. Last joint of the palpi short, acutely pointed; third joint *furnished with a stout short spine,* directed inwards or somewhat oblique. Claws briefly pectinate in a serrate form, *furnished with a very stout unidentate median piece.* Two rows of stout setæ on the back. Total length 0·70–0·75 millim.

Hab. Shores of the Mediterranean on the Corsican moss (*Trouessart*).

3. *Agauë microrhyncha.*

Trouessart (10), p. 181.

Char. Like the two preceding in general form, *but with a short, small, and feeble rostrum.* Epistome obtuse. Claws pectinate, except those of the first pair, with no projection at the median piece. *Dermal cuirass complete,* the dorsal plates having only a nearly linear space between them. Total length 0·43 millim.

Hab. Shores of the Mediterranean on the Corsican moss, with the two preceding species (*Trouessart*).

4. *Agauë cryptorhyncha*, sp. n.

Char. Similar to *A. hirsuta*, but with the *anterior legs scarcely longer* and a little stouter than the others, second and fourth joints armed with large blunt prickles. Two stout pointed prickles below the penultimate (4th) joint of the second pair of legs. *Rostrum in great part concealed beneath the*

epistome, of which the *anterior margin*, cut *squarely* and a little rounded, advances as far as half the length of the second joint of the palpi. Inward spine of third joint very slender. *Claws pectinate* except the first pair; tooth of the median piece appearing to be inserted *beneath the tarsus* in the form of a short spine (except in the first pair, where it is in its normal position, as in *A. hirsuta*). Plates of the cuirass finely punctured, leaving little space between them. Total length 0.68 millim.

Hab. Shores of Tierra del Fuego, Cape Horn (*Hariot*), upon Algæ (*Ceramium Dozii*).

Genus SCAPTOGNATHUS, gen. nov.

Char. Rostrum large, separated from the body by a well-marked constriction, pyriform as in the genus *Leptognathus*. Palpi very stout, *arranged laterally, widely separated from each other, and constructed to act horizontally one opposite to the other*; second joint very long and very stout, armed at its extremity with a strong double spine directed inwards; third joint null or very small; fourth bent downwards, very slender, styliform. Epistome very short or null, leaving the rostrum exposed. Hypostome very long, attaining the extremity of the second joint of the palpi, strongly spatuliform. Mandibles very long and very slender, with the point straight styliform.

Only one species known. Notwithstanding the resemblance presented by this type in the general form of the rostrum to the genus *Leptognathus*, it differs therefrom essentially in the structure of the parts of the mouth. The palpi, with the second joint very robust and furnished with an inwardly-directed fork at its extremity, constitute organs of prehension evidently intended to act in the horizontal and not vertical direction. On the other hand the very slender mandibles can act only in an antero-posterior direction by sliding in the groove of the hypostome.

1. *Scaptognathus tridens*, sp. n.

Char. Rostrum very large, nearly as long as the body; second joint of the palpi in the form of a cubitus, of which the olecranon would represent the anterior extremity outwards; this extremity furnished within *with a strong forked spine in the form of a mattock*, forming, with the slender and pointed last joint, which is bent downwards, a sort of trident. Hypostome transparent, dilated in front in the form of a T. Legs all

slender, cylindrical, with feeble, non-pectinate claws. Cuirass sculptured like the skin of a Crocodile, especially on the base of the rostrum. Total length 0·75 millim. (rostrum alone 0·30 millim.).

Hab. Le Croisic (*Chevreux*), Roches de Castouillet, by dredging with swabs.

Genus LEPTOGNATHUS, Hodge, 1860.

Leptognathus, Hodge (2); Lohmann (8), p. 86.

Char. Rostrum very long, compressed, constricted at the base. Palpi articulated upon the dorsal surface of the rostrum, along the median line, forming, with the elongated pointed hypostome, a forceps, of which the movable branches (palpi) move vertically; the second joints of the palpi touching each other throughout their length in repose. Claw of the mandible recurved. Epistome very short, apparently replaced by the base of the maxillary palpi. Three species of this genus have been described.

1. *Leptognathus falcatus*.

Leptognathus falcatus, Hodge (2).

Rhaphignathus falcatus, Brady (3), p. 307, pl. xlii. figs. 7-10.

Leptognathus falcatus, Lohmann (8), p. 89.

Char. Epistome extending as far as the base of the palpi, between which it projects in the form of a small button. Anus projecting in a bulb-like form. *Plates of the cuirass smooth.* Total length 0·90 millim.

Hab. French coast: Pas-de-Calais, Wimereux (*Giard*), on *Lasæa rubra* and *Corallina officinalis*. English coast (*Hodge, Brady*): Laminarian and Coralline zones, Northumberland and Scilly Islands.

2. *Leptognathus marinus*.

Lohmann (8), p. 88, figs. 121, 122.

Char. Differs from the preceding species chiefly by its small size. Total length 0·60 millim.

Hab. French coast: Le Croisic (*Chevreux*), Grande Côte, on *Corallina officinalis*. Baltic: Kiel (*Lohmann*), upon red and green Algæ, at 12 fathoms.

3. *Leptognathus violaceus*.

Kramer, Arch. f. Naturg. 1879.

Char. This species appears to differ from the preceding only by its *pitted cuirass*. Total length 0·88 millim.

Hab. Pools of Thuringia, upon Algæ (*Kramer*).

Synoptical Table of the Genera of the Family Halacaridæ.

A. Rostrum short, triangular; four joints in the palpi, which are short, convergent.	}	Palpi lateral, separate	1. RHOMBOGNATHUS, Trt.		
		Palpi touching above the rostrum	2. SIMOGNATHUS, Trt.		
B. Rostrum elongate, not constricted at its base, with the palpi parallel.	}	Four joints in the palpi.	Only three joints in the palpi	3. COLOBOCERUS, Trt.	
			Joint 3 of palpi much shorter than joint 4.	Palpi terminated by a simple point.	4. HALACARUS, Gosse.
				Palpi terminated by a double point.	Subg. LEPTOPSALIS, Trt.
			Joint 3 of palpi nearly as long as joint 4.		5. AGAUE, Lohm.
C. Rostrum much elongated, constricted at its base, pyriform.	}	Palpi lateral, widely separated, appearing to be formed of only three joints.	6. SCAPTOGNATHUS, Trt.		
		Palpi in contact above the rostrum, with four well-developed joints.	7. LEPTOGNATHUS, Hodg.		

XXVI.—*The right Generic Names of some Amphipoda.*

By the Rev. THOMAS R. R. STEBBING, M.A.

IN the 'Annals and Magazine' for December 1868, Norman defined a new genus *Helleria*, with *Helleria coalita*, n. sp., for the type. By a slip either of the pen or of the press the superior antennæ were said to be *with*, instead of *without* secondary appendage. That the superior antennæ were much shorter than the inferior was made a generic character. Earlier in the same year, 1868, as was subsequently pointed out by Eaton, the name *Helleria* had been given by Ebner to a genus of the Isopoda. The Amphipod genus, however, was left with its name unaltered until 1887. In that year E. Chevreux, having obtained specimens of both sexes of Norman's species, renamed the genus *Guernea*, with a Latin rendering of the original definition. In this he retained the statement that the upper antennæ have an accessory flagellum, but omitted the character describing them as longer than the lower antennæ, because he found that this did not apply to